

THE INVENTION CLAIMED IS:

1. A method of manufacturing an integrated circuit comprising:
providing a semiconductor substrate having a semiconductor device provided thereon;
forming a dielectric layer of non-barrier dielectric material capable of being changed
5 into a barrier dielectric material;
forming an opening in the non-barrier dielectric layer;
changing the dielectric layer to change the non-barrier dielectric material around the
opening to form a barrier dielectric material around the opening; and
depositing a conductor core over the dielectric layer to fill the opening and connect to
10 the semiconductor device.

2. The method of manufacturing an integrated circuit as claimed in claim 1
wherein forming the dielectric layer uses SiCOH as the non-barrier dielectric material.

3. The method of manufacturing an integrated circuit as claimed in claim 1
wherein forming the dielectric layer uses SiCOH as the non-barrier dielectric material and
15 changing the dielectric layer changes the SiCOH to SiC(H) as the barrier dielectric material.

4. The method of manufacturing an integrated circuit as claimed in claim 1
including depositing a change assisting material on the dielectric layer before depositing the
conductor core.

5. The method of manufacturing an integrated circuit as claimed in claim 1
20 wherein depositing the conductor core deposits a material from a group consisting of copper,
aluminum, gold, silver, a compound thereof, and a combination thereof.

6. A method of manufacturing an integrated circuit comprising:
providing a semiconductor substrate having a semiconductor device provided thereon;
forming a dielectric layer of non-barrier dielectric material capable of being reduced
25 into a barrier dielectric material;
forming an opening in the non-barrier dielectric layer;
reducing the dielectric layer to change the non-barrier dielectric material around the
opening to form a barrier dielectric material around the opening;
depositing a seed layer over the dielectric layer to line the opening;
30 depositing a conductor core over the seed layer to fill the opening and connect to the
semiconductor device; and

planarizing the conductor core and the seed layer to form a channel.

7. The method of manufacturing an integrated circuit as claimed in claim 6 wherein forming the dielectric layer uses SiCOH as the non-barrier dielectric material.

8. The method of manufacturing an integrated circuit as claimed in claim 6 wherein forming the dielectric layer uses SiCOH as the non-barrier dielectric material and reducing the dielectric layer uses thermal treatment to reduce the SiCOH to SiC(H) as the barrier dielectric material.

9. The method of manufacturing an integrated circuit as claimed in claim 6 including depositing an atomic layer of oxygen-gettering material on the dielectric layer before depositing the seed layer.

10. The method of manufacturing an integrated circuit as claimed in claim 6 wherein depositing the seed layer and the conductor core deposits a material from a group consisting of copper, aluminum, gold, silver, a compound thereof, and a combination thereof.

11. An integrated circuit comprising:

a semiconductor substrate having a semiconductor device provided thereon;
a dielectric layer of non-barrier dielectric material capable of being changed into a barrier dielectric material and having an opening provided therein, the dielectric layer around the opening of the barrier dielectric material; and
a conductor core over the dielectric layer to fill the opening and connect to the semiconductor device.

12. The integrated circuit as claimed in claim 11 wherein the dielectric layer is of SiCOH as the non-barrier dielectric material.

13. The integrated circuit as claimed in claim 11 wherein the dielectric layer is of SiCOH as the non-barrier dielectric material and the dielectric layer is of SiC(H) as the barrier dielectric material.

14. The integrated circuit as claimed in claim 11 wherein the conductor core is of a material from a group consisting of copper, aluminum, gold, silver, a compound thereof, and a combination thereof.

15. An integrated circuit comprising:

a semiconductor substrate having a semiconductor device provided thereon;

a dielectric layer of non-barrier dielectric material capable of being reduced into a barrier dielectric material and having an opening provided therein, the dielectric layer around the opening of the barrier dielectric material;

a seed layer over the dielectric layer to line the opening;

5 a conductor core over the seed layer to fill the opening and connect to the semiconductor device; and

planarizing the conductor core and the seed layer to form a channel.

16. The integrated circuit as claimed in claim 16 wherein the dielectric layer is of SiCOH as the non-barrier dielectric material.

10 17. The integrated circuit as claimed in claim 16 wherein the dielectric layer is of SiCOH as the non-barrier dielectric material and the dielectric layer is of SiC(H) as the barrier dielectric material.

18. The integrated circuit as claimed in claim 16 wherein the seed layer and the conductor core are of a material from a group consisting of copper, aluminum, gold, silver, a
15 compound thereof, and a combination thereof.